Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 21 November 2007 has been entered.

Allowable Subject Matter

2. Claims 1-10, 12 and 14-19 are allowed. The following is an examiner's statement of reasons for allowance as summarized from applicant's remarks dated 21 November 2007: As asserted by applicant, Roberts et al., at column 5, lines 36-42, discloses selective modification of template entries when a speaker is verified. Roberts does not specifically disclose an update of normalization parameters, but rather an update of speech template parameters which are similar to the parameters of an acceptance voice model (or template), a feature recited at the beginning of claim 1, at line 3. Parameters of an acceptance voice model are not the same as normalization parameters to be updated.

Modification of a template, e.g., an acceptance voice model, is different from updating a normalization parameter, as defined by claim 1, for at least the following reasons. Roberts explains template modification at column 7, line 54-colum 8, line 5, which says the template of a registered user is modified by captured speech samples. Roberts fails to determine normalization parameters, such as μ_b and σ_b, and modifies only a template acceptance voice model. Although a modification may be functionally similar to an update, the Roberts template modification cannot

be a function of a preceding value of a template because the Roberts template does not have a value. In contrast, a normalization parameter has a value and can be updated, contrary to the Roberts template, which determines likelihood with respect to a speaker voice segment to be tested, and which can be eventually modified.

Further, the Roberts template modification is not a function of the speaker verification score because the modification depends only on captured speech samples. The speaker verification score is only used if it crosses a threshold.

In addition, the condition to modify the template is not the same as the condition to update a normalization parameter because Roberts Indicates this modification occurs if an input utterance is above an acceptance threshold. This latter point is based on the Roberts disclosure at column 5, lines 49-53, or column 5, line 65-column 6, line 5, as an explanation of that comparison. However, Roberts fails to disclose any normalization verification score, which is higher than a threshold to provide updating the normalization parameter.

From the foregoing, Roberts fails to disclose any of the features at the end of claim 1. The likelihood ratio $\Lambda(X)$ of the Reynolds article is not a normalized verification score as set forth in applicant's claims. The likelihood ratio $\Lambda(X)$ is not a function of speaker verification score S_v and normalization parameters, at least one of which is updated. Furthermore, a likelihood ratio in the logarithmic form does not have a "normalized" character, similar to the verification score S_v of the application that is already expressed in logarithmic form. The "log" function in itself is not a normalization parameter.

Thus, Reynolds fails to disclose normalizing, by use of normalization parameters (μ_λ and σ_λ), a speaker verification score S_v (similar to the likelihood ratio $\Lambda(X)$) dependent on a likelihood

ratio between a voice segment to be tested and an acceptance model and a rejection model for deriving a normalized verification score S_N. Consequently, Reynolds also fails to disclose a comparison of the normalized verification score to a threshold.

Neither Roberts nor Reynolds suggests a normalized verification score as set forth in independent claims 1, 12 and 18. The combination of Roberts and Reynolds relates to a modification of a speech acceptance template (acceptance model) if a raw (not normalized) verification score dependent on the likelihood ratio between a voice segment to be tested and acceptance and rejection models is above a threshold.

In order to better distinguish these two thresholds, the ends of claims 1, 12 and 18, have been amended to include the limitation of cancelled claims 11, 13 and 20.

Roberts discloses only one threshold to which a speaker utterance is compared. This single threshold separates an acoustic feature space into two categories "Accept" and "Reject" (column 5, line 60-column 6, line 2). If the speaker utterance is above this threshold, the speaker is accepted and a template can be modified. If the speaker utterance is below this threshold, the speaker is rejected. Reynolds also discloses 0nly one threshold to accept or to reject a speaker. Applicant's claims indicate the first threshold is used to authorize access to an application by the speaker and a second threshold is used to update a normalization parameter.

Therefore, it would not have been obvious to one having ordinary skill In the art at the time of the invention to use the combination of the teachings of Roberts and Reynolds to deduce the features at the end of independent claims 1, 12 and 18 relating to normalization parameters and normalized verification score.

In addition, all dependent claims are also allowable for at least being dependent upon the allowed independent claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUSTIN W. RIDER whose telephone number is (571)270-1068. The examiner can normally be reached on Monday - Friday 8:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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/J. W. R./
Examiner, Art Unit 2626
04 April 2008

/David R Hudspeth/
Supervisory Patent Examiner, Art Unit 2626